Remarks

This is in response to the Office Action dated April 9, 2003.

Initially, applicant wish to bring to the Examiner's attention related application serial nos. 10/256, 826 and 10/256,855. Applicants note that, at the time of the invention, the present application and the above-related applications were owned by, or subject to an obligation of assignment to, Penwest Pharmaceuticals.

Subsequent to the filing of the present application, the undersigned determined that Bob Sherwood, Joseph Zeleznik, and David Schaible were omitted as inventors, and that this omission was without deceptive intent. However, by virtue of the amendments to the present application which are submitted in this paper, it is believed that the inventorship originally claimed in the present application (Theissing and Berkulin) is correct for the application as amended. Therefore, there is no need to change the inventorship in this application.

Turning to the Office Action dated April 9, 2003, the Examiner has rejected claims 8-12 under 35 U.S.C. § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim which applicant regards as the invention. In response to the examiner's suggestion, the terms "dry extracts", "characterized in that", "at least one additional substance", and "spray drying process" have been replaced in claim 8 with terms that applicant believes more particularly point out and distinctly claims the invention. Claims 10 has been cancelled, thereby obviating the Examiner's rejection of that claim. With regard to the term Povidone (formerly in claim 11, now in claim 8), this term was incorrectly identified as a trademark term in the present application. A copy of page 7700 of the Merck Index (11th Ed.) is attached, which demonstrates that povidone is a generic term, which has a definite meaning in the art. Claim 12 has been amended to recite "a particle size".

Claims 8-11 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,519,961 to Schumacher et al ("'961 patent"); Claims 8-12 stand rejected under 35 U.S.C. § 103 as obvious over the '961 patent; claims 8, 10, and 11 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,030,645 to Tritch et al ("'645 patent") or U.S. Patent No.

4,395,491 to Hohl et al. ("'491 patent"); and claims 8-11 further stand rejected under 35 U.S.C. § 102(e) as as anticipated by U.S. Patent No. 6,447,815 to Menon et al ("'815 patent").

Claim 8 is the only pending independent claim. As amended, this claim recites:

> 8. A process for preparing a dry extract comprising: **combining**, in a **spray dryer**, a **liquid extract of a medicinal plant** and a **dry substance** to produce a spray dried composition ***consisting essentially of*** said liquid extract and said dry substance, wherein the dry substance is selected from the group consisting of lactose, maltodextrin, dextrin, dry glucose, starch, microcrystalline cellulose, Povidone, polyethylene glycol, calcium phosphate, magnesium stearate, precipitated silicic acid, precipitated silica, highly dispersed silica, sorbitol, mannitol, and mixtures thereof

Initially, applicants note that neither the '645 patent nor the '491 patent teach the spray drying of an extract of a medicinal plant. The '491 patent is directed solely to salinomycin, and the active agents described in the '645 patent (lipophilic vitamins and polyunsaturated fatty acids) are not medicinal plant extracts. As the Examiner did not reject original claim 9 (which recited that the liquid extract is an extract of a medicinal plant) in view of these references, it appears that the Examiner agrees with applicants' position . Withdrawal of the Examiner's rejection of claim 8 as anticipated by the 645 patent and the '491 patent is therefore respectfully requested

Applicants also note that the '645 patent additionally requires the use of calcium silicate as a coating (see col. 2). Withdrawal of the Examiner's rejection of claim 8 as anticipated by the 645 patent is therefore respectfully requested on this basis as well.

In support of his rejection of claims 8-11 as anticipated by the '815 patent, the Examiner asserts:

> Menon teaches a spray-drying process of preparing dry herbal powders from liquid herbal extracts, including medicinal herbal plants, via the addition of an auxilliary agent, such as maltodextrin during the process of spray-drying (see, e.g., Figure 3, col. 4, lines 54-60, col. 5, lines 23-32).

In response to the Examiner's 35 U.S.C. § 112, ¶ 2 rejection, claim 8 has been amended to clarify that the dry substance is combined with the liquid extract "in the spray dryer". The

'815 patent does not disclose, or in any way suggest, such a process. To the contrary, in the '815 patent, the "auxiliary agent" is added to the "liquid concentrate" containing the liquid extract, and this liquid concentrate (including the liquid extract and the auxiliary agent) is subsequently dried in the spray dryer. See col. 4, lines 54-60, col. 5, lines 23-32, col. 7, lines 58-60 (Example 1); col. 8, lines 26-29 (Example 2); col. 8, lines 55-58 (Example 3); col. 9, lines 18-20 (Example 4); col. 9, lines 47-50 (Example 5); col. 10, lines 11-14 (Example 6); col. 10, lines 43-45 (Example 7); col. 11, lines 11-14 (Example 8); col. 12, lines 35-37. Withdrawal of the Examiner's rejection of claim 8 as anticipated by the '815 patent is therefore respectfully requested.

With regard to the '961 patent, this patent notes:

> In the conventional processes which produce powders having the desired properties, for example, an aqueous dispersion of the oily active ingredient in a film-forming colloid from the group comprising the proteins,e.g. gelatin and casein, ***or the polysaccharides, e.g. pectins, or gum arabic*** or cellulose compounds, with or without a sugar or sugar alcohol, e.g. glucose, lactose, sucrose or sorbitol, and in most cases with the addition of an antioxidant, an emulsifier and/or a preservative, is prepared, the dispersion is atomized, and the resulting particles are then dried.
>
> * * *
>
> It is an object of the invention to provide a process by means of which active ingredients which are sensitive to oxidation, in particular oily active ingredients, can be converted into finely divided powders in a simple manner.
>
> We have found that this object is achieved, in accordance with the invention, by dispersing an **oil-soluble substance**, ***e.g. a vitamin, a carotinoid, a pharmaceutical active compound or an aroma***, in an aqueous solution of ***a film-forming colloid***, . . . with the addition of one or more substances from the group comprising the mono-, di- and ***polysaccharides***, atomizing the dispersion, in a spray tower, in the presence of a spraying auxiliary, and collecting the resulting particles in a fluidized bed, **wherein, as the spraying assistant**, . . . a hydrophobic silica or a metal salt of a higher fatty acid . . ., **is introduced . . . above the fluidized bed and distributed uniformly in the spraying space** . . ..
> '961 patent, Col. 1, lines 25-35, and col. 2, lines 12-35

The Examiner has asserted that this patent "teaches a spray drying process for preparing dry extract powders from liquid extracts via the addition of one or more auxiliary dry agents, such

as silica, calcium stearate, and/or magnesium stearate, directly during the step of spray-drying", and "further disclose that the liquid extract can be prepared from a plant material -i.e. pectin . . . and gum arabic." Initially, applicants note that the only reference to "pectin" or "gum arabic" appears in the description of the prior art process which clearly does not employ the addition dry auxiliary agents in the spray drying process. In describing its allegedly inventive process, the '961 patent only refers broadly to "mono-, di- and polysaccharides", and does not suggest that the polysaccharide be pectin, gum arabic, or any substance derived from a plant material. As such, it is respectfully asserted that the '961 patent does not, as the Examiner alleges, disclose or suggest spray drying a medicinal plant extract with "one or more auxiliary dry agents".

Moreover, applicants note that the '961 patent additionally requires that the dispersion to be spray dried include an "oil-soluble substance, e.g. a vitamin, a carotinoid, a pharmaceutical active compound or an aroma" in addition to the "mono-, di- and polysaccharides". As such, the '961 patent does not disclose or suggest "a spray dried composition ***consisting essentially of*** said liquid extract and said dry substance" as required by claim 8.

For the above reasons, applicants respectfully request withdrawal of the Examiner's rejection of claim 8 as anticipated by, or obvious over, the '961 patent.

In view of the arguments and amendments set forth above, reconsideration and allowance of claim 8 is respectfully requested. As claims 12, and 16-22 depend from and incorporate the limitations of claim 8, allowance of these claims is requested as well.

Respectfully submitted,

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...mol wt 786.48. Hg 25.51%, I ... Also crystallizes with 1-2 mols H_2O. ...crystals; deliquesc in moist air. *Poison!* ...sol in alcohol, ether, acetone. *Keep well* ...

...Topical anti-infective, disinfectant.

...Topical antiseptic, disinfectant.

...m Tetroxalate. Potassium quadroxalate; ...t of sorrel. $C_4H_3KO_8$; mol wt 218.16. C ..., K 17.92%, O 58.67%. $KHC_2O_4.H_2C_2O_4$. ...*essential salt of lemons*".

...or white crystals; permanent in air. ...colorless ...cold, 12 parts boiling water; slightly sol in ...

...rust and ink spots; in metal polishes; in ...

...m Thioantimonate(V). Potassium sulfan... ...Sb; mol wt 367.29. K 31.94%, S 34.91%, Sb ...

...colorless to yellowish crystals. Sol in ...alcohol. The aq soln is strongly alkaline. ...*in a cool place.*

...m Thiocarbonate. Potassium sulfocarbon... ...trithiocarbonate. CK_2S_3; mol wt 186.41. C ..., S 51.61%. K_2CS_3.

...deliquesc granules or crystals. Very sol in ...soln is strongly alkaline. *Keep tightly closed.* ...ytical chemistry. Monograph: K. N. Johri, ...*without H_2S using Potassium Trithiocar*..., New York, 1963) 107 pp. *Caution:* Irri...

...m Thiocyanate. Potassium sulfocyanate; ...rhodanide; Rhocya. CKNS; mol wt 97.18. C ...3%, N 14.41%, S 33.00%. KSCN.

...deliquesc crystals. d 1.89; mp about 173°, the ...ning brown, then green, blue, and white again ...One gram dissolves in 0.5 ml acetone, 12 ml ...boiling alcohol. When dissolved in its own wt ...temp drops about 30°. The aq soln is neutral. ...LD_{50} orally in mice, rats: 594, 854 mg/kg, ...*J. Am. Pharm. Assoc.* **29,** 152 (1940).

...May cause skin eruptions, psychosis. ...artificial mustard oil; printing and dyeing tex... ...ography as intensifier; in analytical chemistry. ...now is replacing it for most of these uses. ...Hypotensive.

...m Thiosulfate. Potassium hyposulfite. ...wt 190.32. K 41.08%, O 25.22%, S 33.70%. ...crystallize with 0.33 to 1.5 mol H_2O. ...hygroscopic crystals. Sol in water; insol in al... ...*well closed.*

...m Titanyl Oxalate. *Dipotassium bis[eth...O,O']oxotitanate(2−);* titanium potassium ...yl potassium oxalate. $C_4K_2O_9Ti$; mol wt ...10%, K 24.58%, O 45.26%, Ti 15.06%. K_2TiO-...

...Cryst powder. Very sol in water. ...*potassium oxodioxalatodiaquotitanate(IV).* ...ordant in dyeing cotton and leather.

...m Triiodide. I_3K; mol wt 419.80. I ...81%. Monohydrate prepd by adding the stoi... ...amount of iodine to a hot soln of KI and cooling ...Wheeler, Z. *Anorg. Allgem. Chem.* **1,** 453 ...Chalker, *J. Am. Chem. Soc.* **39,** 565 (1908). ...stable only as the monohydrate, dark brown, ...monoclinic prisms. d_4^{15} 3.498. mp 38° (closed ...of iodine at 225°, leaving KI. "Incongruently" ...sol (with partial decompn) in alcohol, ether. ...

...m Triiodomercurate(II) Solution. Mercu... ...iodide soln; potassium mercuriiodide soln; ...iodohydrargyrate; Channing's soln; Thou... ...prepd by dissolving 1 g HgI_2 and 0.8 g KI in ...100 ml. *Poison!* ...agent for alkaloids. ...Topical antiseptic, disinfectant.

7692. Potassium Triiodozincate. Potassium zinc iodide; zinc potassium iodide. I_3KZn; mol wt 485.24. K 8.06%, I 78.47%, Zn 13.47%. $KZnI_3$.

Very hygroscopic crystals. Very sol in water. *Keep well closed.*

7693. Potassium Tungstate(VI). K_2O_4W; mol wt 326.06. K 23.98%, O 19.63%, W 56.40%. K_2WO_4. Crystallizes also with $2H_2O$.

Heavy, deliquesc, cryst powder. d 3.12. mp 921°. Sol in about 2 parts cold, about 0.7 part boiling water; insol in alcohol. *Keep well closed.*

7694. Potassium Uranate(VI). Potassium diuranate; uranium oxide orange. $K_2O_7U_2$; mol wt 666.33. K 11.74%, O 16.81%, U 71.46%. $K_2U_2O_7$.

Orange powder. Insol in water; sol in acids.

USE: Painting on porcelain.

7695. Potassium Uranyl Nitrate. Uranyl potassium nitrate. $KN_3O_{11}U$; mol wt 495.19. K 7.90%, N 8.49%, O 35.54%, U 48.08%. $K(UO_2)(NO_3)_3$.

Greenish-yellow, cryst powder. Sol in about 1 part water.

7696. Potassium Uranyl Sulfate. Uranyl potassium sulfate. $K_2O_{10}S_2U$; mol wt 540.35. K 14.47%, O 29.61%, S 11.87%, U 44.05%. $K_2(UO_2)(SO_4)_2$.

Dihydrate, greenish-yellow, cryst powder. Freely sol in water.

7697. Potassium Xanthogenate. *Carbonodithioic acid O-ethyl ester potassium salt; ethylxanthic acid potassium salt;* potassium ethyldithiocarbonate; potassium ethylxanthogenate; potassium ethylxanthate. $C_3H_5KOS_2$; mol wt 160.30. C 22.48%, H 3.14%, K 24.39%, O 9.98%, S 40.01%. C_2H_5-OCS_2K. Made by treating an alcoholic soln of CS_2 with alcoholic KOH. Usually contains 8-10% H_2O.

White to pale yellow crystals or cryst powder. Very sol in water; sol in alcohol. The aq soln is strongly alkaline. *Keep well closed and protected from light.*

USE: As reagent in analytical chemistry.

7698. Potassium Zinc Sulfate. Zinc potassium sulfate. $K_2O_8S_2Zn$; mol wt 335.71. K 23.29%, O 38.13%, S 19.10%, Zn 19.48%. $K_2Zn(SO_4)_2$.

Hexahydrate, crystals. Sol in water.

7699. Potassium Zirconium Sulfate. Zirconium potassium sulfate. $K_4O_{16}S_4Zr$; mol wt 631.88. K 24.75%, O 40.51%, S 20.30%, Zr 14.44%. $K_4Zr(SO_4)_4$.

Trihydrate, $K_4Zr(SO_4)_4.3H_2O$, cryst powder. Sparingly sol in water; the aq soln is acid to litmus.

7700. Povidone. *1-Ethenyl-2-pyrrolidinone polymers; 1-vinyl-2-pyrrolidinone polymers;* poly[1-(2-oxo-1-pyrrolidinyl)ethylene]; polyvinylpyrrolidone; polyvidone; P.V.P.; RP 143; Kollidon; Peregal ST; Periston; Plasdone; Plasmosan; Protagent; Subtosan; Vinisil. Solns are known as *Haemodyn.* Produced commercially as a series of products having mean mol wts ranging from about 10,000 to 700,000. Prepared by Reppe's process: 1,4-butanediol obtained in the Reppe butadiene synthesis is dehydrogenated over copper at 200° forming γ-butyrolactone; reaction with ammonia yields pyrrolidone. Subsequent treatment with acetylene gives the vinyl pyrrolidone monomer. Polymerization is carried out by heating in the presence of H_2O_2 and NH_3. *Cf.* P. B. reports **163; 1288**; also DeBell *et al., German Plastics Practice* (Springfield, 1946); Hecht, Weese, *Münch. Med. Wochenschr.* **1943,** 11; Weese, *Naturforschung & Medizin* **62,** 224 (Wiesbaden, 1948), and the corresp vol. of *FIAT Review of German Science.* Monographs: General Aniline and Film Corp., *PVP* (New York, 1951); W. Reppe, *Polyvinylpyrrolidon* (Monographie zu "*Angewandte Chemie*" no. 66, Weinheim/Bergstr., 1954).